



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/041,678	01/07/2002	Gilbert Wolrich	10559-610001 / P12849	2963

20985 7590 10/20/2004

FISH & RICHARDSON, PC
12390 EL CAMINO REAL
SAN DIEGO, CA 92130-2081

EXAMINER

CHACE, CHRISTIAN

ART UNIT	PAPER NUMBER
----------	--------------

2187

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/041,678

Applicant(s)

WOLRICH ET AL.

Examiner

Christian P. Chace

Art Unit

2187

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>9/13/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office action has been issued in response to amendment filed 13 September 2004. Claims 1-23 are pending. Applicants' arguments have been carefully and respectfully considered in light of the instant amendment, but they are not persuasive. Accordingly, this action has been made FINAL.

Information Disclosure Statement

eIDS's submitted 13 September 2004 have been considered by examiner. Signed and initialed copies are attached hereto.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Chang et al (US Patent # 5,634,015).

With respect to independent claims 1 and 16, a method and article comprising a computer readable medium that stores computer-executable instructions (method) is disclosed in the abstract as providing for data communications.

Storing queue descriptors in a memory, the queue descriptors each specifying a structure of a respective queue is disclosed in column 18, lines 12-16, which discloses a

QCB in the GAM (discussed in ore detail below) which stores a head pointer and a queue tail pointer, which are queue structures.

Determining which of the queue descriptors stored in the memory were most recently accessed according to “a criterion” is disclosed in column 18, lines 6-11, which discusses a queue being a list of packets stored in sequence, with a packet at the queue head being for urgent traffic. Being for urgent traffic is the “criterion” used. As the packets are received in sequence, the most recently accessed is at the top of the queue, and would, therefore, be dequeued from the head, as discussed in the citation.

Storing the determined subset (the subset being interpreted by examiner to be the QCB head pointers which inherently refer to the top of the queue list, or the most recently accessed packets, as discussed supra) of queue descriptors on a cache in a processor’s memory controller logic, the determined subset of queue descriptors stored in the cache including less than all of the queue descriptors stored in the memory, is disclosed in column 12, lines 29 and 30, which discuss the GAM local memory (cache) accessed by the processor P14. The subset of queue descriptors are the QCB head pointers for the most-recently accessed packets, which are not all of the packets.

Applicants do not claim storing ONLY the subset, e.g.

Receiving a request to perform an enqueue or a dequeue operation with respect to a particular queue is disclosed in column 17, line 7 as an enqueue operation. A dequeue operation is disclosed in column 11, lines 40-43, which discloses releasing a packet to a free list of buffer space. This release inherently requires dequeuing, as there cannot be a queue for a buffer that does not exist any longer.

A queue descriptor (buffer pointer) is disclosed in column 17, lines 45-47. A cache is disclosed in figure 1 as local memory #30. Referencing a corresponding queue descriptor stored in the cache (in a processor's memory controller logic) to execute the operations, the queue descriptor specifying a structure of the particular queue is disclosed in column 17, lines 20-51 as the BTE, which is stored in the local memory and references corresponding descriptors.

With respect to claims 2, 10, and 17, maintaining a list of addresses associated with the subset of queue descriptors stored in the cache is disclosed, again, as the BTE stored in GAM local memory #30 in column 17, lines 20-51. The list being stored in a content addressable memory, or CAM, is disclosed in column 11, line 17, which discloses that the GAM local memory #30 is indeed a CAM. Also, column 48, lines 57-59 reinforce the desirability of an associative memory, which is what a CAM is.

With respect to claims 3 and 18, storing in the cache a queue descriptor corresponding to each address in the list I disclosed in column 17, line 25.

With respect to claims 4, 11, and 19, "tracking" an address stored in the local memory is disclosed in column 18, lines 5-12, the address corresponding to a queue descriptor that was least recently used for an enqueue or dequeue operation, as discussed supra with respect to claims 1 and 16.

With respect to claims 5, 12, and 20, removing the LRU address from the list if the list lacks an entry corresponding to the queue specified by the request and replacing the removed address with an address corresponding to the specified queue is disclosed in column 2, lines 22-28.

With respect to claims 6, 13, and 21, issuing commands to the memory controller logic to return and fetch queue descriptors to and from the memory is disclosed in column 17, lines 35-45. Maintaining coherence between the queue descriptors in the cache and the list of addresses in the local memory (CAM) is performed through the 1:1 ratio of descriptors each having their own address, as disclosed in the cited passage.

With respect to claims 7 and 14, modifying the queue descriptor referenced by the enqueue or dequeue operation and returning the modified queue descriptors to memory from the cache is disclosed in column 17, lines 45-51. When a buffer goes from free buffer to allocated, the BTE information is "modified," or changed.

With respect to claims 8 and 23, executing an enqueue operation without waiting for completion of a previous operation is discussed in column 5, lines 26-29. Also, column 16, line 38 discloses "multicast," which being multiple operations being performed at one time, reads on the instant claim as well. The passage recites, "Without waiting for sources" of new allocation, a new allocation being an enqueue operation.

With respect to independent claim 9, a memory to store queue descriptors is disclosed as PM #16 in figure 1, to which the BTE references queues. The BTE specifies the structure of the respective queues stored in PM #16 as they are allocated from the free buffer pool.

A network processor is disclosed coupled to the memory as #22 in figure 1.

A memory controller logic that includes a cache (#30) to store a subset of the queue descriptors (BTE) in the memory is disclosed as GAM #18 in figure 1 as well.

Determining which of the queue descriptors stored in the memory were most recently accessed according to “a criterion” is disclosed in column 18, lines 6-11, which discusses a queue being a list of packets stored in sequence, with a packet at the queue head being for urgent traffic. Being for urgent traffic is the “criterion” used. As the packets are received in sequence, the most recently accessed is at the top of the queue, and would, therefore, be dequeued from the head, as discussed in the citation.

Storing the determined subset (the subset being interpreted by examiner to be the QCB head pointers which inherently refer to the top of the queue list, or the most recently accessed packets, as discussed supra). The subset of queue descriptors are the QCB head pointers for the most-recently accessed packets, which are not all of the packets. Applicants do not claim storing ONLY the subset, e.g.

A programming engine that accesses a list of addresses in the memory corresponding to the queue descriptors stored in the cache is disclosed as BTE, as discussed supra with respect to claims 1 and 16.

The processor being configured to reference a corresponding queue descriptor in the cache in response to a request to perform an enqueue or dequeue operation with respect to a particular queue, also discussed with respect to claims 1 and 16, is disclosed in column 17, lines 45-47.

With respect to claim 15, the processor being configured to execute an enqueue operation without waiting for completion of a previous operation is disclosed supra with respect to claim 8. Doing so if the queue would otherwise be “unempty” upon completion of the dequeue operation is disclosed in column 20, lines 23-27.

Response to Arguments

With respect to applicants' argument that neither the GAM nor the GAM local memory disclosed in Chang can not be equivalent to the cache in applicants' claim 1, examiner respectfully disagrees. As discussed supra with respect to the independent claims, applicants' amended claim language recites storing the subset in memory, the subset being less than all of the queue descriptors. The subset of the queue descriptors are the QCB head pointers for the most-recently accessed packets, which are not all of the packets. Applicants do not claim storing ONLY the subset, therefore, whatever else, in addition to the most-recently accessed packet QCB head pointers that may be stored, is not commensurate to the claim language.

With respect to applicants' argument that, "Chang neither describes nor suggests modifying the structure and storage of the packet descriptors..." examiner respectfully disagrees. The claims recite specifying a structure and determining a subset, but nowhere does claim 1 recite "modifying" the structure. Therefore, this argument is not commensurate with the claim language.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

Art Unit: 2187

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian P. Chace whose telephone number is 703.306.5903. The examiner can normally be reached on 9-4-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 703.308.1756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'C. P. Chace', followed by a long horizontal line.

Christian P. Chace